

## Silicon Carbide Corrugated Mirrors for Space Telescopes, Phase I

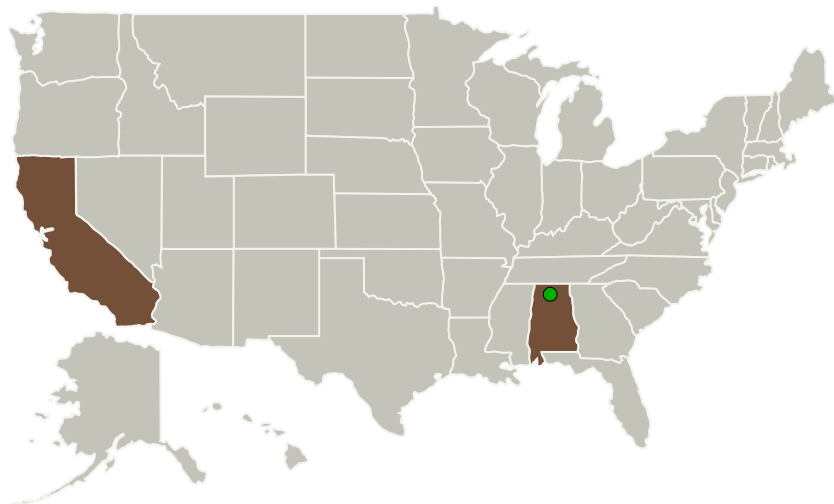
Completed Technology Project (2011 - 2011)



## Project Introduction

Trex Enterprises Corporation (Trex) proposes technology development to manufacture monolithic, lightweight silicon carbide corrugated mirrors (SCCM) suitable for NASA space telescopes. The manufacturing process for SCCM integrates Trex's patented CVC SiC process technology with ITT's corrugated mirror design. The former technology CVC SiC has been shown to yield an excellent, highly mechanically and thermally stable mirror substrate material, while the latter corrugated mirror concept has been utilized to rapidly and inexpensively fabricate glass mirrors. The SCCM process forms a hollow, closed back corrugated mirror blank by sequentially depositing thin (1-3mm thick) CVC SiC layers onto appropriately designed sacrificial graphite mandrels, which are removed subsequently by burnout in an oxidizing high temperature furnace. Nominally, the hollow SCCM then consists of mirror facesheet layer, a corrugated interior layer and a backsheet layer, each intimately chemically bonded with each other by the CVC SiC layer-on-layer deposition process. The result is a monolithic, highly stiff, mechanically and thermally stable mirror substrate suitable for visible, UV, EUV, x-ray and infrared telescopes. Furthermore, because of the unique fabrication process, minimal after deposition grinding is required, resulting in a cost-effective, rapid deposition process.

## Primary U.S. Work Locations and Key Partners

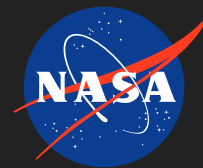


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Organizations Performing Work	Role	Type	Location
Trex Enterprises Corporation	Lead Organization	Industry	San Diego, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	California

## Project Transitions

▶ **February 2011:** Project Start

✓ **September 2011:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138500>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

Trex Enterprises Corporation

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

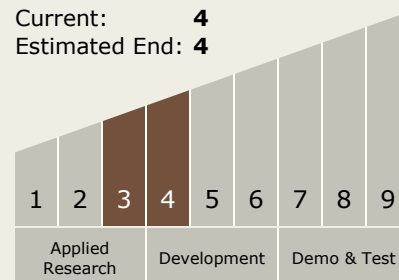
Carlos Torrez

## Principal Investigator:

Clifford Tanaka

## Technology Maturity (TRL)

Start: 3  
Current: 4  
Estimated End: 4



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.2 Observatories
    - └ TX08.2.1 Mirror Systems

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System